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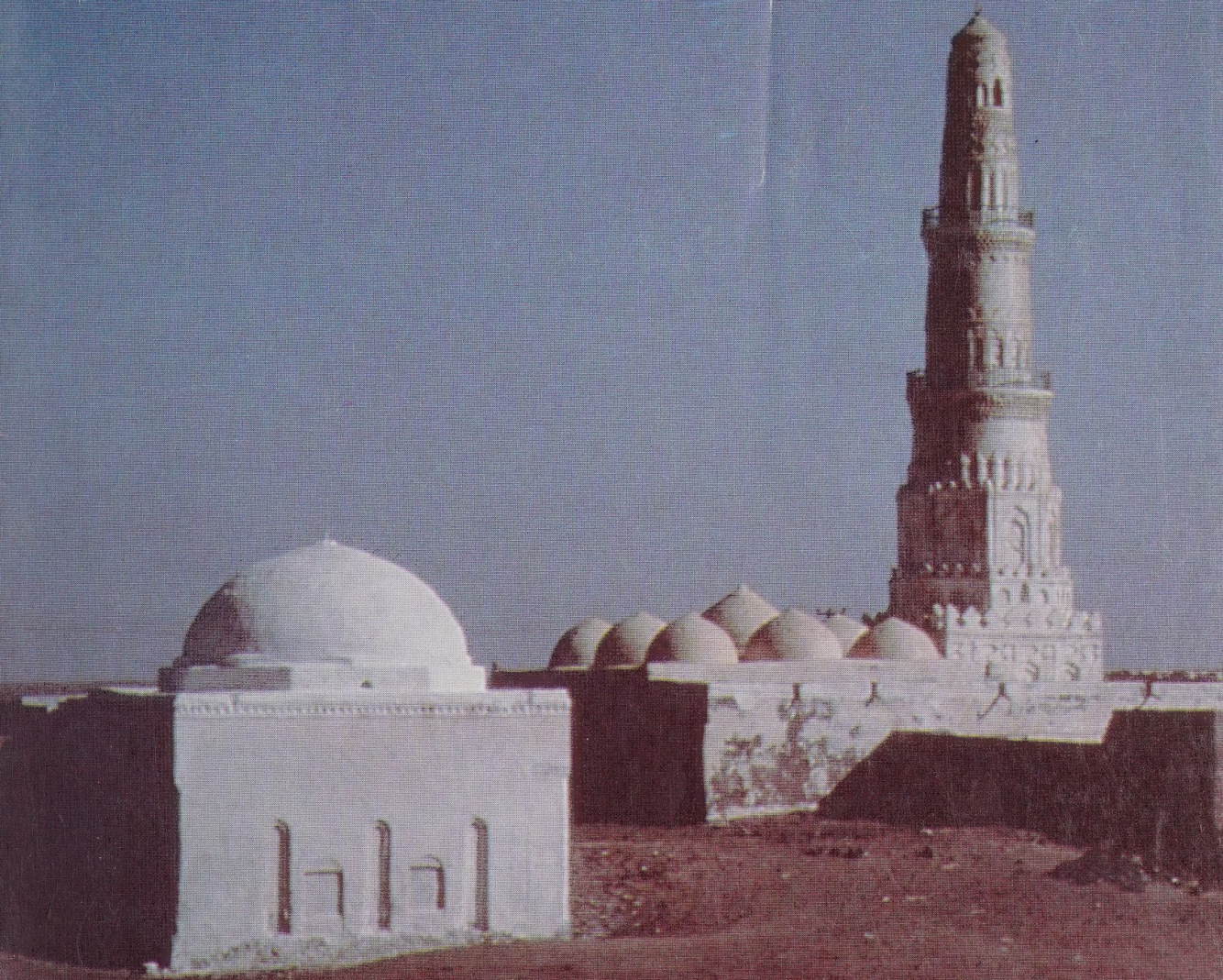

Arabia Felix or Arabia Demens

The Search Changes Direction

Museum in a Suitcase

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ROTUNDA

the magazine of The Royal Ontario Museum

Volume 14, Number 3, Fall 1981

Focus *Brian Musselwhite* 2

Arabia Felix or Arabia Demens *Edward J. Keall* 6
At Home in North Yemen

The Growing Collections 17

Museum in a Suitcase *Mary Fallis Jones* 20
A New ROM Travelling School Case

The Search Changes Direction *Peter L. Storck and Peter H. von Bitter* 28
Ice Age Man in Ontario

Cover photo: Remnants of Mocha's period of glory, when coffee ruled its economy. *(Photo Edward J. Keall, ROM)*

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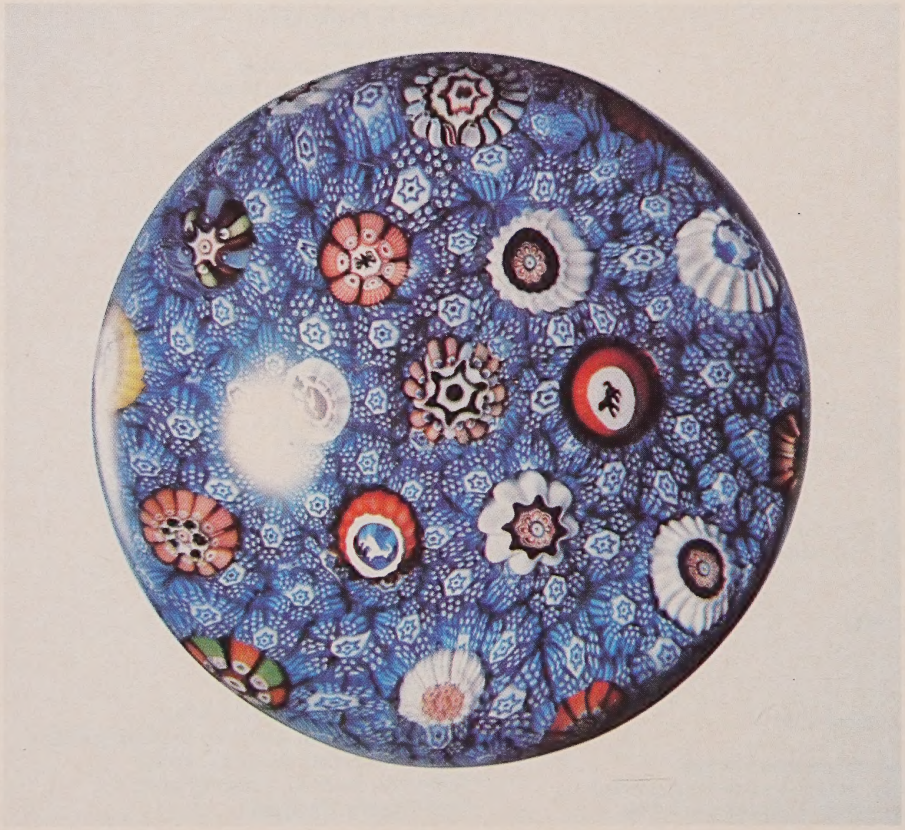
Focus on...

Classic Paperweights 1845-1855

Brian Musselwhite

ALTHOUGH SOME OF THE TECHNIQUES involved in making glass paperweights originated in ancient times, the classic period of paperweights on the Continent did not blossom and flourish until about 1845, and it lasted only a decade. This art form, however, was taken up in America, where it remained popular until the late 1870s.

While the placement and styling of the decoration inside the paperweight were essentially Victorian, the techniques used to achieve them were not. From the ancient world came a technique in which small decorated solid-glass rods were cut and placed together, creating the impression of a carpet of flowers—hence the Italian term *millefiori*, first used by the Germans in the 19th century. The flower design was not the only result of this technique; silhouettes of animals and portraits of human faces were also created. A second type of decoration, filigree, was achieved by twisting together two coloured solid-glass rods. This process challenged the dexterity of the glass worker, since a greater skill produced a finer threadlike spiral. Both ancient techniques had



Left: This carpet or millefiori paperweight from Baccarat contains many of the most interesting rods from that factory. Because one of the rods is dated "1848", the paperweight is one of the most valuable in the collection for its documentation.

reappeared earlier in wine-glass stems, millefiori during the Venetian Renaissance and filigree in 18th-century England.

Lampwork, the third type of decoration used in paperweights, had appeared in the 16th and 17th centuries; the technique consists of manipulating glass, usually in the form of coloured rods, over a torch or blow-lamp to form realistic three-dimensional objects or figures. By the late 18th century the fourth type of decoration to be used in paperweights—the insertion of ceramic cameos (now called sulphides) into glass—had been developed. But the paperweight, with its unique magic and mystery, as we know it today, could not be produced until Victorian technology and ingenuity added the last essential element—the magnifying glass crown.

The paperweight, an object of intense beauty, fragile as a butterfly's wing, is therefore at once ancient yet modern, formal yet fluid. Its ephemeral images—the flash of fireworks against the night sky, the delicate short-lived flower, the hovering insect, the ripe fruit—are crystallized in a moment of time.

Above: Many of the paperweights in the collection contain lampwork flowers. In this one from Baccarat the blue fringed gentians float over a base which was cut to give greater brilliance.

Left: One of the most beautiful contributions to the collection is this paperweight by Baccarat that holds a butterfly hovering over a flower.

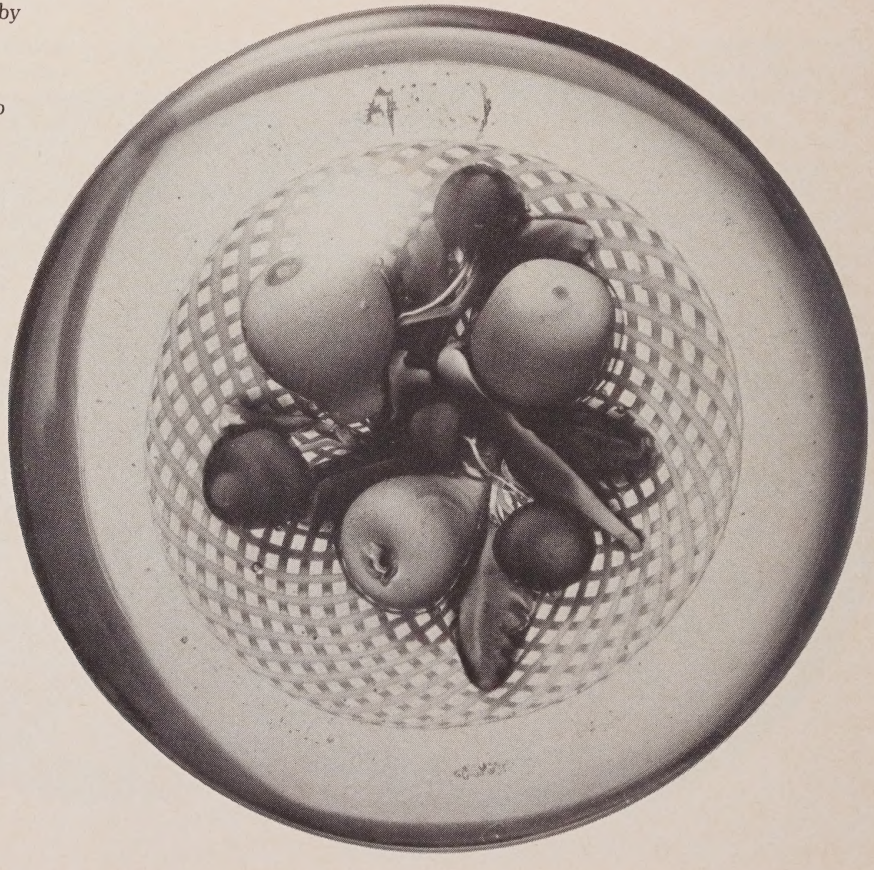
Despite their Victorian origin, these unusual glass forms were rarely mentioned in written articles of the day and were relegated to stationery shops or emporiums of decorative knickknackery. They were largely ignored and neglected; nevertheless, such an eclectic aesthete as Oscar Wilde and such royal personages as the Empress Eugenie, the Empress Carlotta, the Duke of Cardoza, the Princess Murat, the Marquis de Bailleul, and, during this century, King Farouk of Egypt acquired select collections.

Until recently the ROM's collection of paperweights comprised only three items, which were used principally for study. The Alice Hall Collection of paperweights, recently donated to the European Department, has improved this unhappy situation. The collection, which consists of more than 280 glass paperweights, is a fairly good representation of paperweights in general, and also includes many rare and excellent items. The leading glass paperweight firms of Clichy, Baccarat, and St. Louis are well represented. The collection also contains smaller groupings from England, America, Italy, and Sweden and a number of important paperweights from the repertoires of Charles Kaziun and Paul Ysart, two outstanding modern craftsmen.

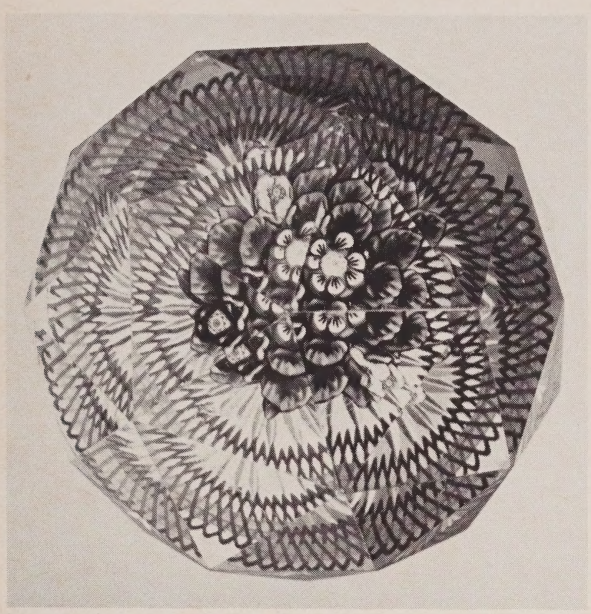
Contrary to popular belief, the collecting of paperweights is not the exclusive preserve of dilettantes (good paperweights now regularly sell at auction for from $1000 to $12 000, occasionally for more). Now, with the acquisition of the Alice Hall Collection, paperweight enthusiasts, a growing body of students and collectors, will find the Museum's offerings well worth their notice. No collection, however, is ever complete, and we hope that the paperweights now in the ROM will act as magnets for other collections.

Brian Musselwhite is Technician in the European Department of the ROM.

Photos: Bill Robertson, Photography Department, ROM

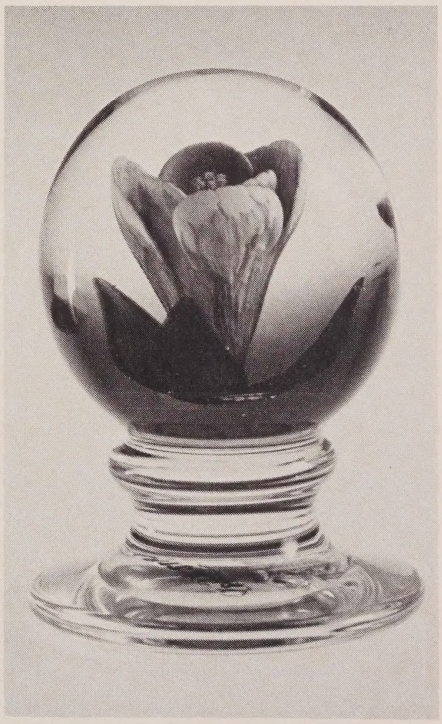


The fruit-in-a-basket paperweight by St. Louis is one of the many fine examples from that factory. It is sometimes hard to remember that glass was the only medium used to create this piece.

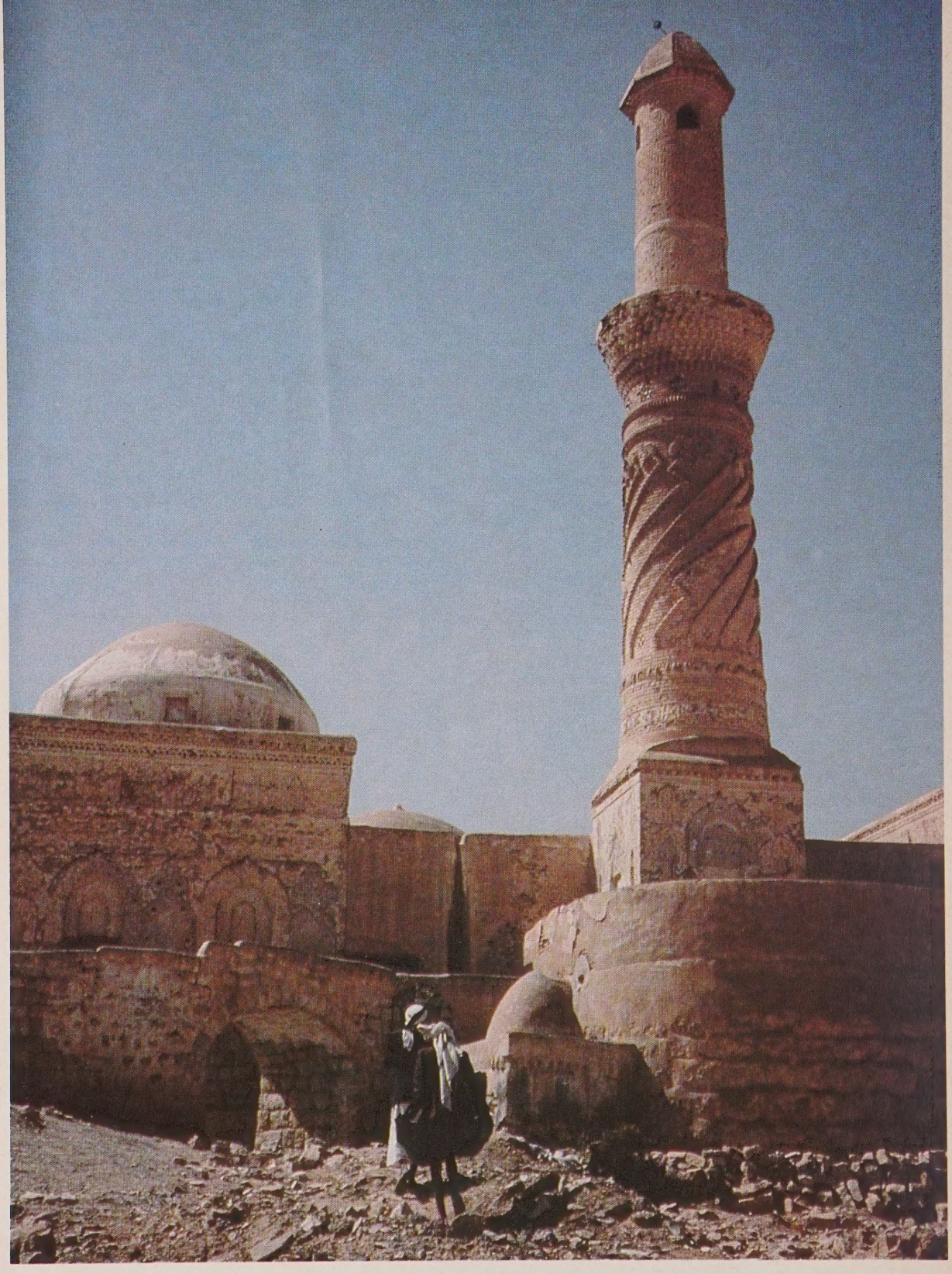


Left: The dome of glass is important for its magnification properties. In some paperweights, such as this one from Baccarat, the dome was faceted to enhance the magnification.

Below, right: By the end of the 19th century much of the knowledge and skill of the classic period of paperweight making was lost, but the art form was revived in the 20th century. Charles Kaziun, an important American glass artist, created this impressive pedestal paperweight during the 1950s.



Above: A superb magnum paperweight from the Mt. Washington Glass Works in South Boston displays the perfection that this art form achieved in mid-19th-century America.



Above and opposite page, top: Members of the ROM *expedition approaching the minaret that overlooks the courtyard mosque of Zafar, and chatting at the entrance to the covered sanctuary adjoining the courtyard.*

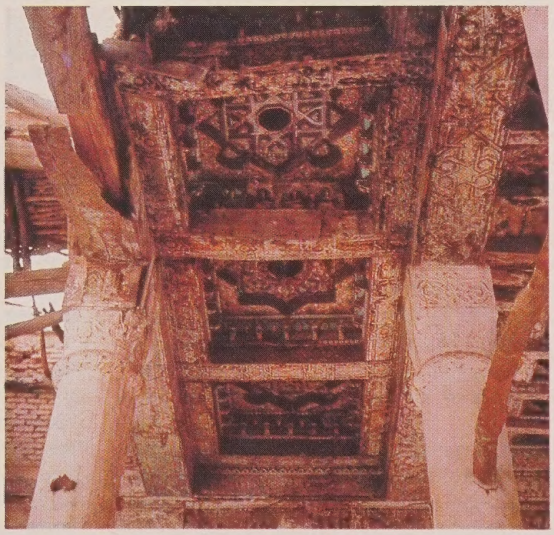
Arabia Felix or Arabia Demens

At Home in North Yemen

Edward J. Keall

"MUST BE THE WIND," said our guide, Abdullah al Salal, as we heard the door in the high wall surrounding the courtyard of the fortress mosque of Zafar click shut. But then we heard the bolt on the outside of the door slide into place. Moments later a rifle shot shattered our puzzled silence—and an empty cartridge shell landed at our feet. Having suspended the ROM project in Iran because of the turmoil there, the last thing I had planned for was this sinister greeting on a remote mountain top in North Yemen.

Since chasing castles on isolated peaks seems to have become a pattern in my academic life, fascination with the human ecology of mountainous tracts in the Middle East led me to seek a new archaeological "home" in the Yemeni highlands after leaving the Zagros of Iran. The temptation to do so came partly from the writings of Umarah the Yemenite, a medieval Arab writer who recorded that early in the 9th century A.D. Ibn Ziyad chose as his realm the Tihamah plain. He settled on the banks of the Wadi Zabid, a seasonal water course, and laid the foundations of a rich local economy, dependent for its prosperity on the irrigated lands of the plain and the terraced hill-



Above: The original 13th-century painted wooden ceiling of the mosque of Zafar—now the focus of the French team's conservation efforts.

The fortified walls of the 13th-century mountain-top fortress of Zafar cling to the edges of the cliffs.

sides behind it. About A.D. 820 Ibn Ziyad built his capital city of Zabid.

A few years later, according to Umarah, Ibn Ziyad freed one of his slaves, Jafar, who as a dutiful Moslem went to Mecca to give thanks at the holiest shrine of Islam. Jafar eventually returned to Yemen with a thousand horsemen at his command. Whether Ibn Ziyad's consequent action stemmed from magnanimity or from prudent discretion is a subject for debate, but the fact is that the ruler granted his freedman a fiefdom in the highlands encircling the headwaters of the Wadi Zabid. Jafar and his descendants ruled the fiefdom for almost a century, until the Ismailis, members of a heterodox Shi'ite Moslem sect, subjected the region to vicious attacks. Although the legendary castle of Mudhaykirah, the traditional seat of Jafar's fiefdom, was destroyed in one of the Ismaili onslaughts, the challenge of finding its remains was irresistible. In the meantime we had reached the mosque of Zafar, built in the 13th century A.D.

As it turned out, the rifleman who locked us inside the mosque and then climbed to the top of the minaret and fired into the air to frighten us was a goatherd. He was tending his family's flock higher up the canyon when he spied our party making its slow ascent from the plains below. Intent on preventing what he regarded as imminent violation of a sacred building of Islam, he rushed to the mosque. Only the presence of our guide kept the situation from becoming very complicated indeed.

We had been given a letter of introduction to Abdullah by a member of a French archaeological expedition which had just concluded a season of study of the ancient mosque. It was once part of a self-contained fortress system, but the fortress is now abandoned and in ruins, and the mosque has no local congregation—except for the occasional passing goatherd—although it still commands respect as a sacred building. The mosque is in a very poor state of repair, with the original painted wooden ceiling of the covered sanctuary in danger of collapse. The French team had spent the season piecing together the history of the building, before recommending an international conservation programme. In his own way, the rifleman was just as interested in conservation.

The fortress-mosque of Zafar belongs to the tradition of courtyard mosques known in academic descriptions by the label "Arab hypostyle" or "columnar sanctuary type". The building consists of an open courtyard enclosed by a wall; at one end of the courtyard is a covered sanctuary, which houses the *mihrab*, a small niche in the back wall facing Mecca and indicating the direction of prayer. This rear *kiblah* wall is the focal point in a mosque and provides

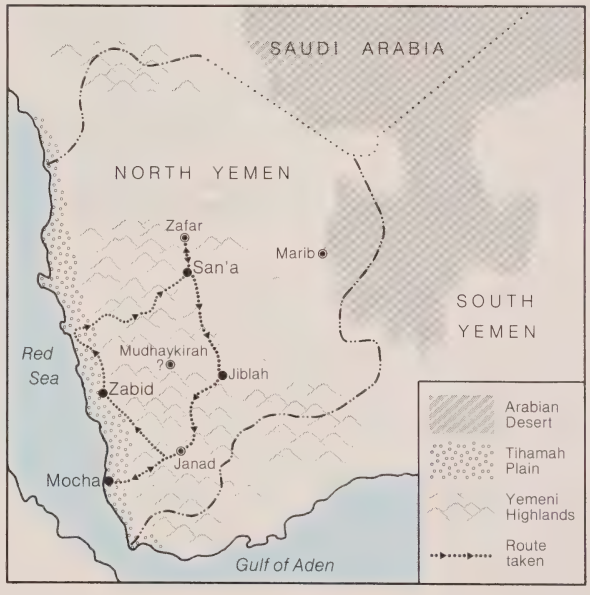
the setting for one of the basic aspects of the religion—regular individual prayer and weekly congregational prayer on Fridays.

This Arab hypostyle mosque is a type that has continued little changed in plan since the earliest days of Islam. When the Arabs began their conquest of the ancient world in the 7th century A.D., they had few monumental architectural traditions of their own to call upon. For the mosques they built in conquered territory, it is generally held, they adopted the plan of Muhammad's simple dwelling at Medina, where he had preached to his followers. In the enclosed courtyard, Muhammad's congregation faced him as he stood with his back to the rear wall. It was, however, the tradition of the original orientation of the building—not the holiness of Muhammad—that dictated the adoption and continuance of the hypostyle form. Moslems are quick to point out that Muhammad was a prophet and not the object of their worship; Islam is the name of their religion, not Muhammadanism.

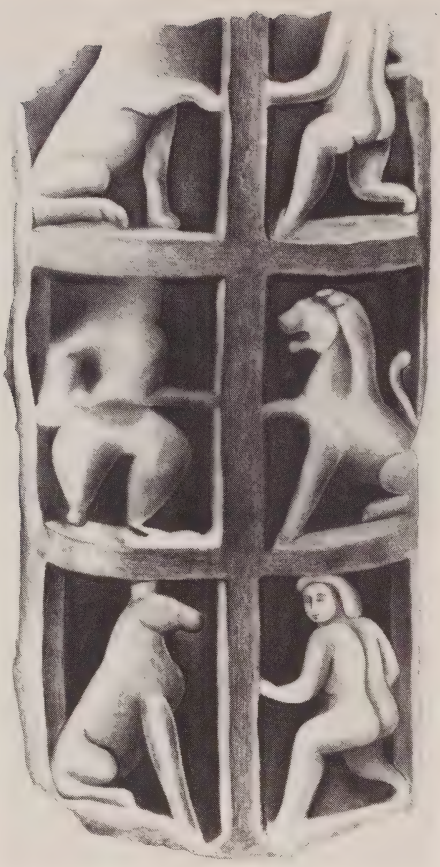
One can follow the Arab hypostyle mosque plan right through North Africa and into Spain. The 10th-century Great Mosque of Cordova differs little in functional concept from the 13th-century mosque of the Zafar fortress. Only in the Turkish and Iranian segments of the Islamic world (including Mogul India) is there a major departure from the simple columnar sanctuary. Inspired by the earlier traditions of Byzantine Christian churches or Zoroastrian fire temples, both of which had domes, Turkish and Iranian architects developed the distinctive domed forms that typify so much of late Islamic architecture. In Yemen, however, mosques retain the earlier original Islamic form—a very fitting circumstance in the country that was the site of the only Islamic mosque built in the lifetime of the Prophet, other than those of Mecca and Medina.

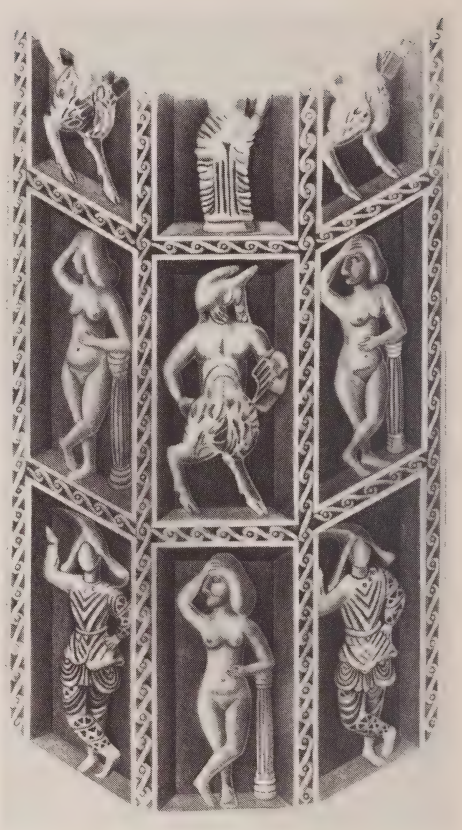
The spread and survival of the early Islamic mosque form is a phenomenon, though not a unique one, in the history of the Middle East. The same thing had happened once before in the Hellenistic era—in the centuries that followed the vast territorial conquests of Alexander the Great. Although Macedonian control of the territories did not last much beyond the death of Alexander, the impact of the Greek artistic vocabulary endured in part for centuries. It held sway from the Mediterranean to the Aral Sea, until the native cultures began to reimpose their own imprint on it.

North Yemen is not lacking in examples of post-Alexandrian artistic expression, and it is particularly satisfying for me—temporarily exiled from archaeological research in Iran—to encounter artwork in Yemen that is not far removed in feeling from art unearthed in Iran by an earlier ROM expedition. The similarity lies not in the subject matter, but rather in the overall concept of the subject, in the method of presentation. In the two Iranian examples from Qal'eh-i Yazdigird illustrated here (they once



(Maps by Catherine Farley)





Left: Sculptured wall decoration from Qal'eh-i Yazdigird, showing figure thrusting lance at seated beast. (Drawn by Carole Richards)

Right: Sculptured wall decoration from Qal'eh-i Yazdigird, showing hatted male, nude female, and Pan figure. (Drawn by Carole Richards)

adorned building columns), the artist has depicted small figures in separate panels, with a repeat. In the Yemeni example (a stray find from the 1950s), the figures are also contained within an architectural framework. The actual identity of the characters in the illustrations is unknown, but they reflect a general sameness of treatment. There is the same attention to the detail of the musculature in all three examples. The individual figures are frozen in what may at first appear to be a non-specific movement. In the first Iranian example, however, one of the figures thrusts a lance at a seated beast (most likely a hyena), and it is probable that the idea of a ritual hunt was immediately apparent to the contemporary observer. The nudity of the male figure perhaps emphasized the heroism implicit in the confrontation.

In the second Iranian example, the design is broken up into separate registers. The personages include a hatted male, a nude female, and a Pan figure. One suggestion is that these frozen figures represent characters in a theatrical performance, whose message would have been clear to the contemporary observer. The artist did not need to depict the unfolding of the entire scene to get his message across. The same is true of the Yemeni example, in which the figures are perhaps personifications of deities. It encompasses the same talismanic element, the same use of nudity to imply extraordinary characteristics, and the same depiction of beasts, which can be associated with heroic or superhuman behaviour. Thus the three examples belong to a similar artistic tradition, not because of identical detailing, but because of the similarity in the style of presentation of an idea.

Some knowledge of the geography of the Middle East, and of its political history in the early Christian era, makes it even easier to understand why the artistic expression of Iran and Yemen remained quite close, even though Alexander had been dead five hundred years. There was ample contact through trade. In fact, the 2nd century A.D. witnessed highly concentrated efforts to transport the exotic products of the Middle and the Far East to the rich markets of the Roman Empire.

In A.D. 97 the Chinese general Ban Chao sent Gan Ying on a mission to the head of the Persian Gulf to try to find a way to circumvent the Iranian (Parthian) intermediaries in the trade between China and Rome. At the head of the gulf there existed the independent principality of Characene, whose merchants

Left: Yemeni sculptured wall decoration within an architectural framework. (Drawn by Carole Richards)

understandably were not keen to have the Chinese disrupt their own satisfactory trade relations with the Romans. They told Kan Ying that it would take more than a year to sail around Arabia in an effort to bypass the overland route through Parthia to Syria, by way of the Euphrates River. While the horrors of the sea journey may have been overstated, it was true that the Red Sea was a hostile stretch of water. Persistent strong winds spelled almost certain disaster for ships sailing at night: they constantly ran afoul of the numerous uncharted coral reefs and sandbars. In any case, the Chinese were deterred in their quest for a direct route to the Mediterranean. The Middle Easterners, on the other hand, moved around relatively freely in the first two centuries A.D. Their caravans crossed the desert, and their ships sailed along the coasts, although full development of coastal shipping was not possible.

Yemen provided a land route for part of the journey to Egypt and the Mediterranean, either at the foot of the highland chain or along the topmost ridge of the range. Dromedaries were able to transport precious cargoes that were light in weight and therefore yielded a high return on volume. The profit was enormous: one successful mission was enough to make a merchant wealthy for life. The advantage to Yemen was that it not only traded its own products—for example, frankincense, which was in great demand in the temples of Egypt and the pagan Roman world—but it also provided port facilities for products coming by ship from farther east. Because Yemen was noted for its terrain and climate, which favoured abundant growth, for a long time the Romans did not realize that Yemen was not the source of all the goods coming to their markets from the East—nor did the Yemenis hasten to disabuse them of their misconception. Thus because the Romans considered Yemen the home of everything exotic, they dubbed it *Arabia Felix* (Arabia the Blessed).

Eventually sailors from the West learned to capitalize on the seasonal winds (the first was a canny Greek named Hippalos). Once they understood the movement of the monsoons, merchants found they could sail to India in one monsoon season and reenter the Red Sea with the corresponding equinoctial winds, although the entire journey took a year. Yemen's monopoly on trade was broken, and in time the break spelled disaster for the economies of the various Sabaean kingdoms that ruled Yemen from

time to time. These kingdoms, however (going back as far as the legendary era of the Queen of Sheba in the first millennium B.C.), had invested much of their trading profit in the development of a highly sophisticated agricultural system, based on terracing and irrigation.

The monsoon winds bring modest amounts of rainfall to the Yemeni highlands twice a year. By terracing the hillsides, and by building dams for the run-off, the ancient Yemenis found they could grow two crops a year, both on the terraces and on large tracts of land that were arable with irrigation. Unfortunately the system was very dependent on capital investment, and the capital began to diminish. In time the bottom dropped out of the incense market (Christian worship made much less use of incense than had the pagan practices), and developments in ships and navigational aids continued to weaken the Yemeni trading position. The end result was the gradual demise of Yemeni agriculture. The collapse of the Marib dam from neglect in the 6th century A.D. is one of the significant events in the early history of North Yemen. In the *Quran* it is associated with human failing. The reality was that the collapse of the dam reflected the fact that economies are as vulnerable to circumstances as they are blessed by them.

One thing rescued Yemen from oblivion—the advent of Islam. By the middle of the 8th century A.D., Islam's conquests stretched from beyond the Oxus River to Spain. New plants were introduced into different parts of the Islamic world. Cotton, which had been known only as a wild perennial plant in India, began to be cultivated in Egypt and Yemen. Citrus fruits, too, found their way from India to the Mediterranean. The soils of Yemen were particularly receptive to the new grains of sorghum and millet. The coastal plain of Tihamah, where the Yemenis had a tradition of terrace farming and dam building, was especially suitable for the cultivation of the various new cereals. The city of Zabid, founded by Ibn Ziyad, flourished as a result of the agricultural revolution.

It was just before Christmas 1980 that the first ROM expedition to Yemen set foot in Zabid, and it was in Zabid that the designation *Arabia Demens* came naturally to mind—not so much Arabia the Blessed as Arabia the Bizarre. The traditional houses of Zabid are delightfully mad. A riot of plaster ornament covers walls of minuscule bricks; the same tiny bricks, in mesmerizing lines, pave the alleyways of the city. The decoration that covers the façades of the houses extends into their interiors, into the main reception and living rooms. One derelict house we examined has a repetitive design of sorghum plants incorporated in its decorative scheme—a reminder of one of the reasons for the region's prosperity in medieval times.

Opposite page: Traditional multi-storied houses in the town of Jiblah in the Yemeni highlands.

Right: A silted-up dam wall dating from the Himyaritic period, 6th century A.D.

A visit to Zabid leaves one feeling a little otherworldly. In the medieval period Zabid was a nucleus of orthodox Sunni Islam, in contrast to the highlands where the Shi'ite sect prevailed. Pious rich patrons subsidized the founding of religious schools, to be named for them, and Zabid achieved fame as a university centre. Strolling through the *suq* (covered market) on a hot afternoon in December 1980, the only evidence we had of thought and concentration seemed to stem from the widespread use of *kat* (a narcotic plant grown in the Yemeni highlands, which, to the layman and at a distance, is indistinguishable from the Benjamin Fig, a shrub seen constantly in North American shopping plazas). Glazed eyes stared out from the clothing stores in the *suq*. While the shop-owners were able to conduct their business, after a fashion, they were all quite clearly "stoned".

Fresh *kat* is delivered to the markets daily, as bundles of twigs with tender leaves. The leaves are pulled off one by one, stuffed into the mouth, and chewed, not swallowed; habitual users end up with a pouch in the cheek. The well-to-do indulge the habit in the privacy of their own homes—in a social ceremony shared with guests who are fellow addicts. The less well-to-do resort to their "chew" quite freely on the streets and in the open-fronted workshops. (The custom is fraught with the same sort of long-term social problems attributable to the abuse of the North American "happy hour".

From the wierd world of the Zabid *suq* our team emerged into the bright sunlight. Our objective was to establish as quickly as possible the age and form of the ancient remains of Zabid. At first the gate system made no sense; the gateways of the old city stood intact, and traffic came and went through them without hitch, although there were no walls left on either side. Aerial photographs provided the clue. The gates had once been connected with the main wall system, but since they were constructed of massive amounts of masonry, they had survived the ravages of time and the depredations of man. As often happens, the bricks of the walls had been stolen for reuse, but the dismantling of the gateways presented too great a challenge.

Modern Zabid does not really spread beyond the limits of its medieval walls. In the area where the walls have disappeared, a few primitive huts house a number of families, but agriculture limits expansion of the city on the side of the *wadi*. Only in the direction of the modern paved road is there any suggestion of urban sprawl. Remnants of the city's medieval past are lying on the surface, essentially where they were left centuries ago. On the dusty mounds surrounding the town we found pieces of 16th- and 17th-century pottery. At first we thought the mounds had been part of a moat system around the town, but aerial photographs showed that they may

well have been part of a flood dyke thrown up in the 16th century A.D. to prevent the inundation of the town by run-off waters, at a time when the irrigation systems and the control of flood waters were no longer as efficient as they had been in their heyday.

Today the threat of erosion is as acute as ever. The high wages offered in the Saudi Arabian oil fields are luring the Yemeni farmers away from the land in droves. With each passing year more terraces collapse, setting in motion a more severe run-off, which has serious consequences for the land downstream. What is more, the Saudi Arabian cash wages that are flooding the Yemeni economy support an increasing demand for *kat*, which is doing away with the cultivation of Yemeni, or mocha, coffee. The coffee thrives in the misty climate of the highlands, and so does *kat*.

In the 16th and 17th centuries A.D., when the coffee trade was at its height, Mocha (see cover) was the principal port city of the Tihamah plain. (Its precursor, in pre-Islamic times, was Muza, whose site has yet to be located.) Then there was an English factory in Mocha to control the quality of the coffee and to regulate the wholesale trade, and buildings six storeys high sprang up along the seashore. In 1709 a defensive wall was built around the city, which gave it a "grand air".

Opposite page, top: Village and terraced hillsides in the highlands south of San'a, the capital of North Yemen.

Opposite page, bottom: The edge of downtown San'a, where Toyotas mingle with riflemen in skirts.

Above: Delightfully mad plasterwork on a 19th-century house in Zabid.

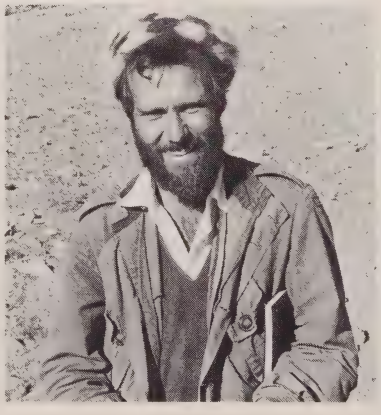
Left: On the Red Sea coast near Zabid strong winds lash the palm trees; inland they cause blowing sands.

By the end of the 19th century the pitiful demise of Mocha had begun: a traveller in 1890 described it as "little more than a vast ruin". In 1980 the ROM expedition found it perhaps even worse off than in 1890. A few tall minarets and mosque domes rise to tell of its former beauty, but the grand old houses, for the most part, stand empty and ruined. Acres of hummocks, some of them covered by moving sand dunes, reveal on their surfaces the broken relics of yesterday's grandeur: blue and white porcelain imported from China, cut crystal from Europe, teacups from Japan. . . . From the archaeological point of view, Mocha is obviously of interest for its own sake. It is also an invaluable guide to the entire region, for everything one finds there is quite likely to postdate the 15th century A.D.

We hope that Zabid, with its hinterland; the not far distant port city of Mocha; and the elusive Muza will become the focus of the second ROM expedition to Yemen—to say nothing of the legendary castle of Mudhaykirah. On Christmas Eve 1980 the first ROM expedition to Yemen drove up the boulder-strewn bed of the Wadi Zabid as far as a four-wheel drive vehicle could take us. Next season in our search for the legendary castle of Mudhaykirah we shall have to resort to travel on foot, and to camels for the baggage.

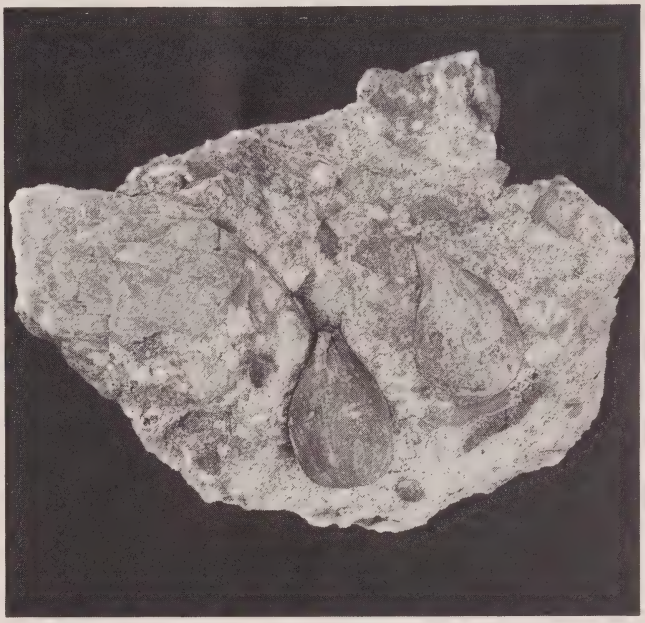
Above: Pathways through the ruined dyke and wall system on the outskirts of Zabid, with the citadel in the distance.

Edward Keall is an Associate Curator in the West Asian Department. Since 1962 he has specialized in archaeological field work in the Middle East, mainly in Iran and Iraq. The Iranian revolution put a stop to the ROM excavations at Qal'eh-i Yazdigird in western Iran in 1979, but this was a perfect opportunity for him to expand his horizons by turning to the rich and largely unstudied archaeological history of southern Arabia. Dr. Keall was accompanied on the ROM expedition to Yemen by Andrew Watson and James Knudstad. The leader of the French archaeological excavations at Zafar was Professor Christian Robin of the Sorbonne.



Photos: Edward J. Keall, ROM.

The Growing Collections



Whether or not plants are preserved as fossils depends on what happens to the plants immediately after death. The speed with which plant material can break down and become unrecognizable is attested to by rotting stumps and compost heaps. However, if buried in an oxygen-free environment some plants may be preserved to be found as fossils millions of years later. Throughout life and after death different parts of the same plant are exposed to different conditions. Thus, in some places, only the leaves will be preserved; elsewhere, the leaves may rot while the stem or the roots endure. Millions of years later the different parts of a plant—roots, branches, leaves, seeds—are found separately and given different names. Only when they are found intact can scientists be sure that the parts belong to the same plant.

An interesting example of the confusion that can arise when only part of a plant is known is illustrated by the plant fossils *"Ficus" ceratops* (right). These fossils closely resemble figs, as the name suggests, and were first described as such in 1911. In 1939 R. W. Brown re-examined the fossil "figs" and noticed that in some examples there appeared to be the remains of a collar or sheath around the neck and that in many ways the fossils resembled the large underground tubers of horsetails *(Equisetum)*. Tubers like these may have been on the bill of fare of dinosaurs such as *Triceratops*. Thus, although the fossil "figs" have been found in association with figlike leaves, it is quite likely that they represent the root of a plant and are unrelated to the fig fruit. The specimens illustrated, about 4 cm long, are from the Upper Cretaceous Hell Creek Formation (80 million years old) near Endive, Montana.

Both leaves and insects are rarely found as fossils. Their scarcity is a function of their fragility and the fact that their natural environment does not normally provide the rapid burial necessary for preservation. A recent purchase by the Department of Invertebrate Palaeontology includes several fossil leaves and insects preserved in a fine shale from the Eocene (45 million years old) of Douglas Pass, Colorado. The specimen illustrated (left) shows a 5-cm-long leaf and a small fly, both unidentified as yet.

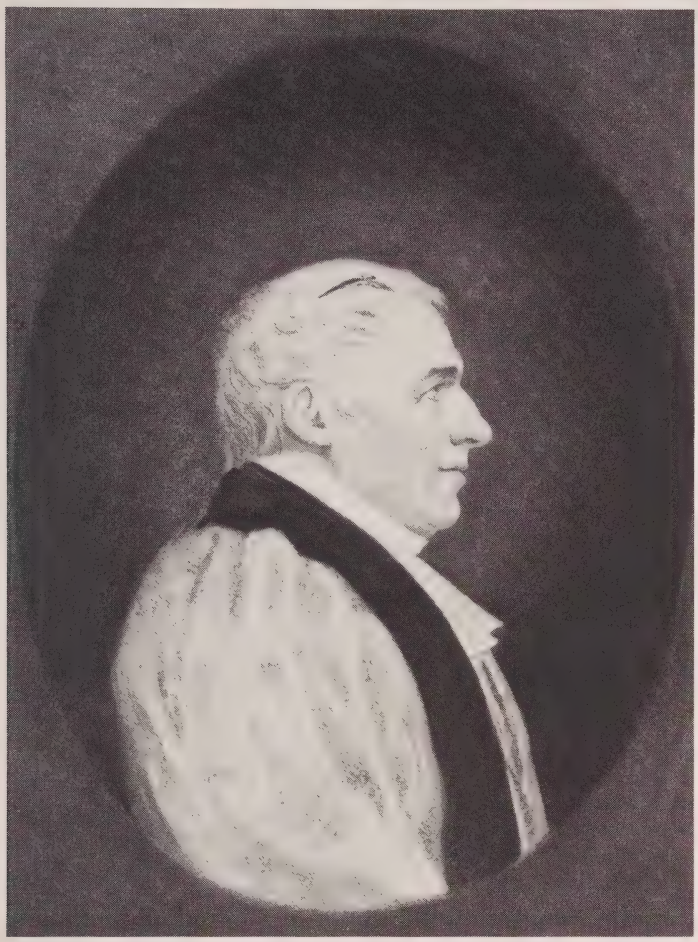
J.B.W. and D.M.R.

Two Scottish kilts with their plaids and accessories were given to the Textile Department in 1981. One, the wedding suit of the donor's grandfather who was married in the county of Ross and Cromarty, is dated about 1870. The other, a sergeant's uniform of the first Seaforth Highlanders' Regiment in MacKenzie tartan, was worn during World War I. The wedding suit was donated by Mrs. Wallace Ferguson of London, Ontario; it consists of the following (right): a kilt and shoulder plaid of the Macrae tartan in red, blue, and green wool twill without the usual fine white line in the sett; a pair of socks; a four-in-hand tie; and a red leather sporran covered with white horse-tail hair and framed with an embossed silver mount. Included are white cotton braces. Inside the waistband of the kilt are six brass buttons stamped with the maker's name "Macdougall & Co., Inverness". On either side is a buckle stamped with "G & Cie., 1862". The pleated shoulder plaid (left) was fastened to the left shoulder by a loop decorated with a rosette of brightly coloured tartan silk ribbon. The upper end of the plaid hung from the shoulder in a fringed point; the base, pleated onto more of the same tartan ribbon, fell to the back and was tied around the waist. The small triangular piece of plaid prevented the dagger worn at the right side of the waist from rubbing against the kilt.

The second outfit consists of a kilt, a shoulder plaid, a Glengarry cap of dark blue wool with inserted diced band, a khaki bonnet, two regimental brooches, and a sporran of brown cowhide stamped "Wallace [Scott?] 1910". The sporran is covered with grey and black horse-hair. Each regimental brooch bears the motto "CUIDICH'N RIGH" (Help the King), a stag's head motif, and a scroll. The kilt, made of heavy wool in a twill weave, has a black and navy blue check—now faded to grey—with white and red broken twill stripes. It is bound at the waistband with bright green wool braid and is faced with cream wool twill. The matching shoulder plaid is much simpler and smaller than the earlier example. Since the plaid was worn only on ceremonial occasions, its blue dye has remained unfaded. The kilt and accessories were given by Mrs. D. McGill of Toronto. They were worn by her father, David White, a resident of Dundee, Scotland, who emigrated to Canada in 1923.

Although the Dress Act of 1746 prohibited male civilians from wearing tartans, kilts, and plaids, the Highland regiments were permitted to dress in their customary distinctive way. Through the traditions of the regiments, Highland dress was developed and maintained. As 1982 is the bicentennial of the repeal of the Dress Act, we may anticipate an increased interest in Scottish dress. Thus the two recent gifts, which represent civilian and military attire, are timely additions to the costume collection of the ROM.

M.H.

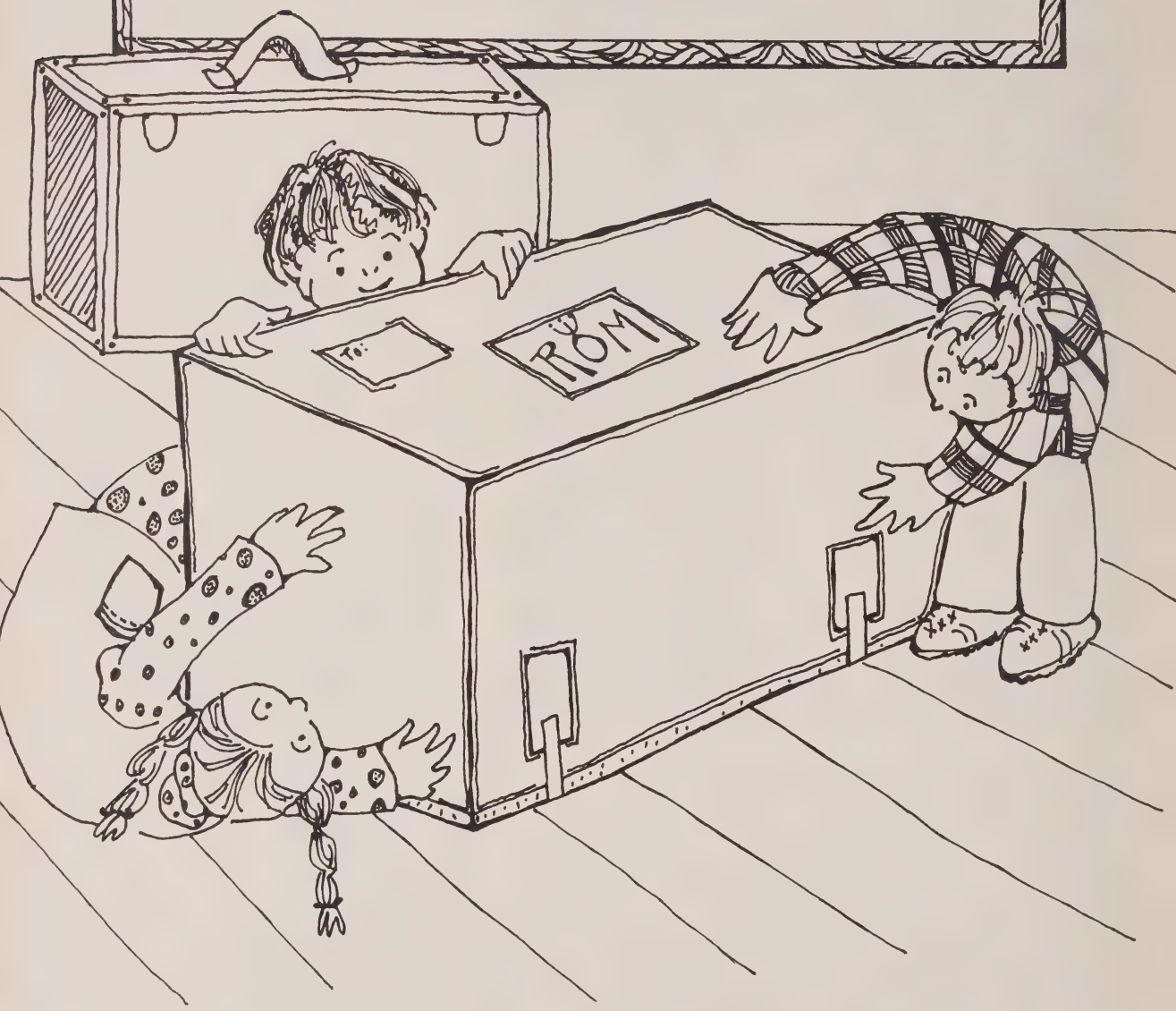


Important additions to the Canadiana Department's picture collection are pastel portraits of the Reverend Jehoshaphat Mountain (left), his wife, and his daughter, drawn about 1803 to 1812 by William Berczy. Jehoshaphat Mountain, elder brother of the first Anglican Bishop of Québec, came to Canada in 1793. He served at Trois-Rivières from 1794 until 1803; from then until his death in 1817 he was Rector of Christ Church, Montréal. The purchase of the portraits was funded in part by a grant from Wintario.

Another recent acquisition by the Canadiana Department, made possible by a repatriation grant under the Canadian Cultural Property Act, is a portrait miniature of Lieutenant-Colonel Thomas Pearson (right). Lieutenant-Colonel Pearson served with the Twenty-third Regiment of Foot in Halifax in 1810. He was appointed Inspecting Field Officer for Upper Canada in 1812, and saw action at Crysler's Farm, Oswego, and Chippewa. This watercolour on ivory was done in Halifax in 1811 by the noted portraitist Robert Field. M.A.

Photos: pp. 18, 19 Photography Department, ROM; p. 17 David Rudkin, ROM.

Museum in a Suitcase



A new ROM Travelling School Case

Mary Fallis Jones

Above: A covered tray of Museum artifacts in The Doll Case. *The dolls are from Africa and China; the doll's nightgown and the pillowcase are Victorian.*

ONE OF THE CREATIVE PROJECTS of the Extension Services Department of the ROM is the Travelling School Case Programme, developed to provide unusual and stimulating educational resources for school children who live outside Metropolitan Toronto and are unable to visit the Museum regularly. The school cases, in a sense, take the Museum to them. To date some thirty cases have been produced, each evolved around a particular theme, often with an interdisciplinary approach. The themes derive from both the sciences and the arts, for example, *Ontario's Amphibians; More Than Meets the Eye: An Introduction to Minerals; Traces of Life: An Introduction to Fossils; Bird, Nest, and Egg;* and *Environmental Adaptations*. And in the arts, *Marco Polo's Journey to China; A Touch of Glass; Do You Dig It? A Study in Historical Archaeology;* and *Shakespeare's England*. During the 1980/81 school year these cases were explored and studied by about 35 000 students in more than 300 schools across Ontario.

These school cases reflect the resources of the ROM and the expertise of its staff. They contain

Below and right: The Doll Case *inspires students to make their own sculptures and drawings with accompanying stories. Here are two by students in Dr. Webb's Grade 6 class at Huron Street Public School, Toronto.*

This doll named Peter is a traveller. He has travelled to many places and will to many more. His shirt came from the city of Toronto. His backpack came from the Alps and inside is a camera with pictures of 1. Big Ben, 2. Eiffel Tower, 3. Empire State Building, 4. Tower of Pisa, 5. Hong Kong Floating Market, and all the rest is food and money.

Robert Kennedy

trays of Museum artifacts or scientific specimens, as well as objects and materials that students may hold and manipulate. But they are not just collections of articles; they provide teachers with a framework for making the best use of museum objects in the classroom. The accompanying material—student activity sheets, teacher's notes, suggested lesson plans, interpretive props, slides, cassette tapes, books, and pamphlets—makes it possible for teachers and students not only to look at but to interpret what they see.

The Doll Case is the newest travelling school case, produced with the cooperation of the Canadiana, Ethnology, European, and Textile departments. It contains dolls from China and Africa, and Victorian dolls' clothes. Because these are Museum artifacts that must not be handled, several other dolls that students may hold and study are included. There are also three small dioramas that depict the cooking area inside a snow igloo, created with miniatures from the Department of Ethnology; a Victorian tea party, complete with Victorian dolls' china plates and teacups from the European Department; and a 19th-century Canadian general store, composed of miniatures from the Canadiana Department. By means of the settings these dioramas provide, stu-

dents are introduced to ways of life far different from their own.

The case also contains paper dolls that encourage students to study costumes ranging from pioneer homespun to Victorian finery—even to the fantasy space gear of *Star Wars'* Darth Vader. The student activity sheets inspire children to fashion their own dolls, to draw or paint dolls, and to write stories about them. For example, students can create pioneer apple or cloth dolls, dolls in the costume of a particular culture, or dolls that are products of pure imagination. Through *The Doll Case* students explore a doll's context—its style of clothing, its social role and intent, and the history and environment of its makers.

The Doll Case was designed for use in primary or junior grades. Students in primary grades learn that dolls can be very old, that dolls are found in countries all over the world, that dolls can be made in many different shapes, styles, and materials, and that their clothing tells us about the climate in their place of origin. Students in junior grades have more sophisticated discussions. For example, they can be encouraged to evaluate a doll's socializing functions by considering such questions as what kinds of dolls were used to teach childcare, sewing, tool-making,

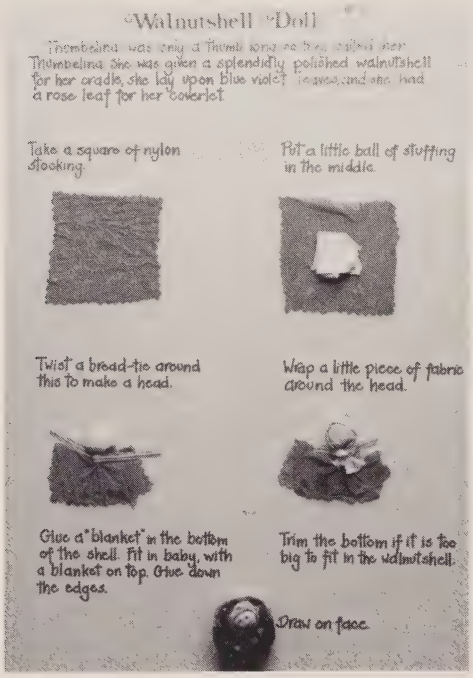
Miss Lupiani
Her base is made of three styrofoam cups. Her arms are made of tongue depressors stuck in one of the styrofoam cups. Her hands are made of yellow plasticine and are held on by pins. She has a white wrap-around skirt and has a long-sleeved yellow blouse. Over that is a black shawl with flowers of all sorts. Miss Lupiani's face is white wool covered with a pink cloth and a drawn-on face. Her hair is white wool covered with a red bonnet.

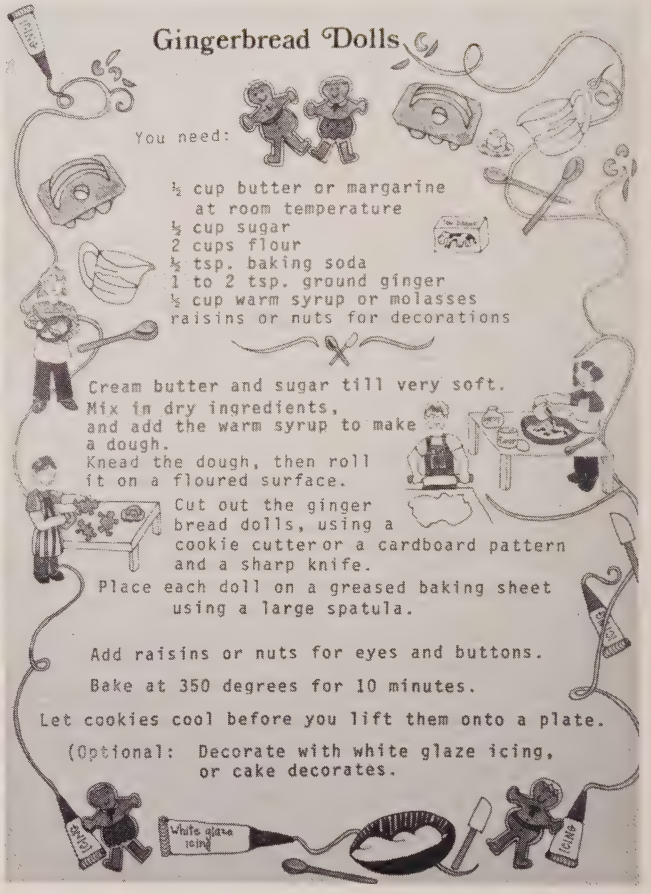
Miss Lupiani lives in Rome, Italy, but has no house. She is 92 years old and a real cat-lady. Every night at 5:00 she walks down to the piazza to feed the cats.

Min-Sook Lee and Megan MacKay

Right: Miniature dioramas depict a Victorian doll's tea party, a general store in 19th-century Canada, and the cooking area inside an Inuit winter igloo.

Opposite page, top: Four dolls in The Doll Case *that students may touch: an apple doll made in the Maritimes, a cradleboard doll made by the Ojibway, and two dolls made by the Inuit—a bone doll and a doll in winter clothes.*


Walnutshell Doll
Take a square of nylon stocking.
Put a little ball of stuffing in the middle.
Twist a bread-tie around this to make a head.
Wrap a little piece of fabric around the head.
Give a "blanket" in the bottom of the shell. Fit in baby, with a blanket on top. Give down the edges.
Trim the bottom if it is too big to fit in the walnutshell.
Draw on face.


Gingerbread Dolls
You need:
½ cup butter or margarine at room temperature
½ cup sugar
2 cups flour
½ tsp. baking soda
1 to 2 tsp. ground ginger
½ cup warm syrup or molasses
raisins or nuts for decorations
Cream butter and sugar till very soft.
Mix in dry ingredients, and add the warm syrup to make a dough.
Knead the dough, then roll it on a floured surface.
Cut out the ginger bread dolls, using a cookie cutter or a cardboard pattern and a sharp knife.
Place each doll on a greased baking sheet using a large spatula.
Add raisins or nuts for eyes and buttons.
Bake at 350 degrees for 10 minutes.
Let cookies cool before you lift them onto a plate.
(Optional: Decorate with white glaze icing, or cake decorates.
White glaze icing

Above and right: Two activity sheets from The Doll Case *with directions for making gingerbread dolls and walnutshell dolls.*

Left: One student in Miss Barnett's kindergarten class at Huron Street Public School was inspired to create her own apple doll, with an accompanying story.

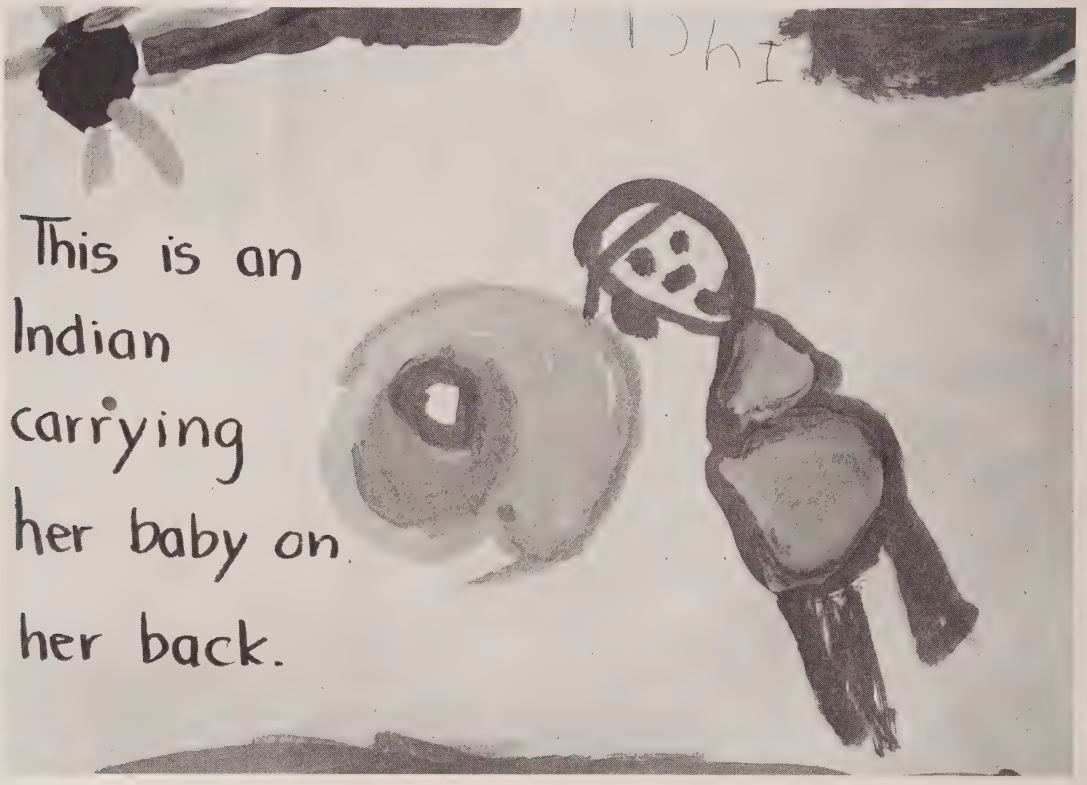
This is the Apple Doll. I didn't copy the real Apple Doll. She has a very frilly dress, brown slippers and a wrinkly face made out of an apple.

Right: Another student in Miss Barnett's class created quite a different doll, again with an accompanying story.

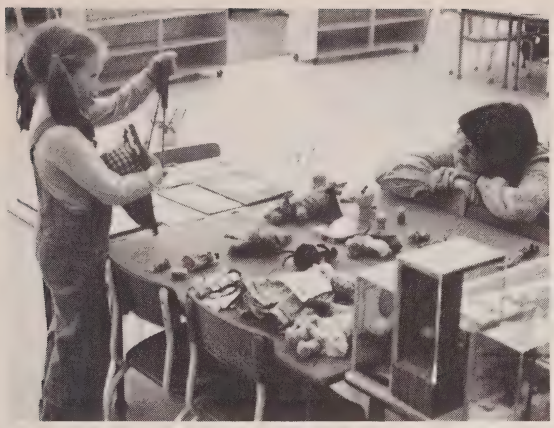
This is a Miss Piggy doll. It's not from the Museum but we added it to the collection.

or hunting skills. One group of grade-six students assessed the messages implicit in "Barbie dolls" and "GI Joe dolls". "Glamour image", "big spenders", "Macho-types", and "rough and tough" were some of the responses elicited from their own observations and analyses.

The Doll Case was recently pretested at Huron Street Public School in Toronto, in both Miss Barnett's kindergarten class and Dr. Webb's grade 6 class. The drawings and stories reproduced here reflect the spirited participation of the students in those classes. We gratefully acknowledge their contribution, their enthusiasm, and their willingness to share their treasures with the "museum lady".



Drawings and stories about the touchable Ojibway and Inuit dolls were created by the students of Miss Barnett's kindergarten class.



Left: A kindergarten student interprets the cradleboard doll. She is explaining how the baby was carried on her mother's back.

Below: Children in the kindergarten class learn to make cloth dolls in much the same way as pioneer children did.

Mary Fallis Jones is a graduate in history and museology from the University of Toronto (B.A., M.Mus.). Before joining the Royal Ontario Museum in 1976, she worked as a teacher and a researcher at the Toronto Board of Education. She is now School Services Coordinator in the Extension Services Department at the Royal Ontario Museum. Mary Jones is the author of The Confederation Generation *(1978) and* La patrie québécoise au début de la Confédération *(1980), both published by the* ROM.

Photos: Bill Robertson, Photography Department, ROM *except p. 20 Evelyn Jones.*

The Search Changes Direction

Ice Age Man in Ontario

Peter L. Storck and Peter H. von Bitter

Map of a portion of southwestern Ontario showing glacial Lake Algonquin and the distribution of Devonian, Silurian, and Ordovician age bedrock. Much of central and northern Ontario was still glaciated 10 000 to 12 000 years ago so Early Palaeo-Indian peoples could have entered the province only from the south. Determination of the source of the chert used for tools would indicate the nature of band movements within southern Ontario. (Map by Catherine Farley)

Opposite page: Early Palaeo-Indian hunters preparing preforms by percussion flaking. (Artwork by Ivan Kocsis)

IT IS WELL KNOWN that in the areas of dating and environmental reconstruction many of the physical and biological sciences make important contributions to archaeological research. What is probably less widely recognized is the relevance of some of these contributions in interpreting human behaviour—what people did, as opposed to when and how they lived. This article concerns the contributions that geology and palaeontology are making to the study of the first peoples to occupy Ontario, Early Palaeo-Indian hunters and gatherers who migrated into the province during the closing phases of the Ice Age some 10 000 to 12 000 years ago. It features a "missing" layer of bedrock, X-rays, microscopic fossils, and fossil corals from a 410-million-year-old subtropical ocean bed.

The story began in 1975 when the survey work that I was directing along the "fossil" beach of glacial Lake Algonquin near Collingwood led to the discovery of the Fisher site, a very large and productive Early Palaeo-Indian site-complex consisting, as later field work showed, of at least nineteen distinct occupation/activity areas. Some of these were probably

contemporaneous; others represent a succession of separate occupations over a period of years.

Study of the artifacts from the Fisher site revealed two facts that were both striking and puzzling. The fluted spear points found at the Fisher site are almost indistinguishable in size, shape, and, apparently, method of manufacture from spear points found at the Parkhill site in southwestern Ontario (excavated by Dr. William Roosa of the University of Waterloo). What is more, most of the artifacts from both sites are made from the same type of chert. Yet the two sites are separated by a distance of some 185 kilometres and occur in different zones of bedrock—deposited during Ordovician and Silurian time in the vicinity of the Fisher site, and during Devonian time in the vicinity of the Parkhill site. It is unlikely that the same type of chert would be present in both regions. Why, then, are the spear points so similar, and how was it that the same raw material was used at both sites?

Long-distance trade between the Fisher site and the Parkhill site might at first seem to be the answer to both questions. However, both sites contain abundant evidence that artifacts were made locally. If there was trade between them, it obviously did not involve finished artifacts. Raw material could have been traded from one site or area to the other, but it seems unlikely that *different* groups of people would have made artifacts that are so similar. This is true particularly of the spear points, since their manufacture required a number of steps that could presumably have been performed in different ways or in a different sequence. The stylistic and technological similarities in the spear points suggest that the same sequence of manufacturing techniques was used at both sites, and, therefore, that both were occupied by the same group of people.

If the same group of people travelled between the two sites, and perhaps between other areas, a knowledge of the source of the chert should tell us something about the direction of their movements. If, for example, the chert came from bedrock of Devonian age, it would have had to be transported from Parkhill to Fisher. This would indicate a south to north movement, such as might have occurred if the Parkhill people were migrating northward to colonize new areas. If, on the other hand, the chert came from rocks of Ordovician or Silurian age, it would have had to be carried southward to Parkhill from the Fisher site, or from elsewhere in the region. This would indicate a two-way movement, first northward to the source of the raw material, and then southward to Parkhill again.

These two interpretations carry quite different implications about the activities of a prehistoric people. It was with these questions in mind that I asked Peter von Bitter if he would be interested in searching for the bedrock source of the chert that

was so abundant and yet so elusive. The opportunity to collaborate with a scientist in another discipline at the same institution in a mutual research interest makes one appreciate the tremendous benefits of working in a museum as diverse as the ROM. Peter von Bitter's story of that search follows.

* * *

When Peter Storck first discussed this project with me, it seemed that fate was taking a hand in my research. Seventeen years earlier I had conducted a survey for the source of chalcedony, a volcanic chert used by Palaeo-Indians who occupied the Debert site in Nova Scotia. In the intervening years I specialized in micropalaeontology, a field of knowledge that is potentially useful in chert identification. In returning to an earlier research interest, this time associated with related peoples in Ontario, I have occasionally paused to reflect on the circular nature of life.

Archaeologists had for years assumed that the chert in question came from deposits of Silurian age in the Georgian Bay region; it was variously called Amabel or "Collingwood" chert. However, despite the fact that pieces of the chert were abundant in some ploughed fields, a clear indication of the presence of a bedrock source in the area, no one had ever chipped a piece from "living" rock.

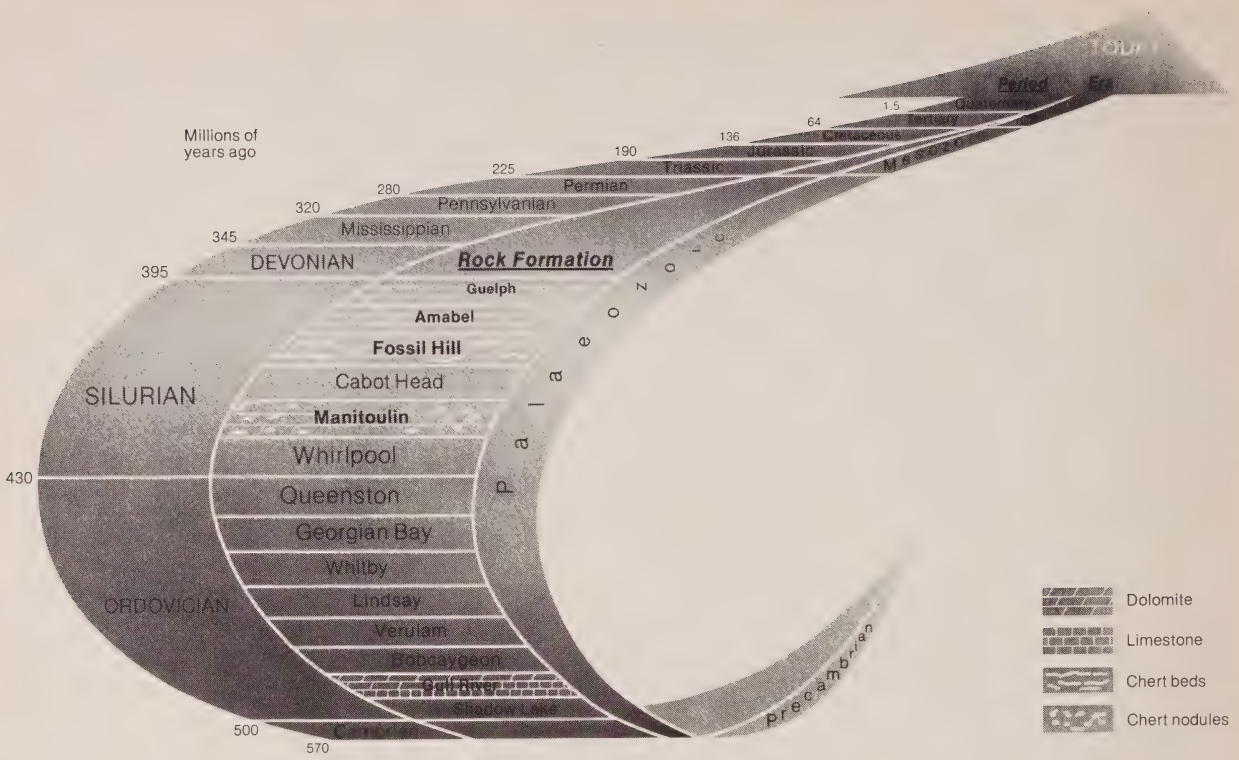
As a first step towards solving the mystery of the "missing" chert bed, I spent some time in the vicinity of the Fisher site examining local outcrops for chert. In July 1978 I made several field trips with Dr. Bruce Liberty of Brock University, who not only has a long-standing interest in Ontario cherts, but who also did much of the geological mapping of the Collingwood area. The results of the initial survey were rather disappointing. Although we found abundant *in situ* cherts in the Manitoulin and Gull River formations, they were chalky and nodular and not at all like the material used by the people who occupied the Fisher site.

By the end of the 1978 field season we were no closer to our mysterious bedrock source than we had been at the beginning, although we ended the season hypothesizing that it probably lay in the highest formation in the area, the Guelph Formation. The formation is present in this area today only as small patches, most of them covered by glacial drift. I speculated that we were dealing with a "ghost" deposit of a previously extensive formation, for which the only evidence lay in the more resistant chert left behind after the more soluble and softer limestones and dolomites had eroded away.

It wasn't until the fall of 1979 that I was able to return to the Collingwood area to continue the search, but this time I discovered the important clues that were to lead to the long-sought source of the chert. A telephone call to Bill Fox, an archaeologist with the Ontario Ministry of Culture and Recre-

Opposite page: Early Palaeo-Indian preform (left) and fluted spear points (centre and right) from the Fisher site. Since this same chert type was also used at the Parkhill site probably by the same people, a determination of its original bedrock source promised to indicate the nature and direction of band movements.

Left: Favosites—*a colonial coral that lived in the sub-tropical seas of southern Ontario 410 million years ago. It was found associated with chert from the Fossil Hill Formation in a field near Collingwood, Ontario.*



ation, disclosed that he had found concentrations of "Collingwood" chert in a field at the edge of the Niagara Escarpment a few kilometres west of Collingwood. He offered to show me the locality, and we met in a farmer's cornfield on a crisp, sunny day in October. "Collingwood" chert was strewn everywhere. It wasn't until a few days later, thinking over the problem in my office at the Museum, that I realized the significance of some pieces that I had collected. In addition to the chert, several fossil corals made of silica, the same substance of which chert is composed, had been found. It seemed more than coincidence that the chert and the fossil corals should occur together in the same field. Could they have originated from the same bedrock source? Study of the palaeontological literature indicated that the silicified corals involved were common in southern Ontario only in the Fossil Hill Formation, formed when warm subtropical seas covered southern Ontario during the Silurian period, 410 million years ago. Could the chert and the fossils both have come from the Fossil Hill Formation, and where does the formation occur in relation to the chert-rich field? The work of a friend and colleague, Dr. Peter Telford of the Ontario Geological Survey, now came into play. His geological maps of the area showed that the Fossil Hill Formation had been identified at six outcrops in the Collingwood area. One of the outcrops was mapped as occurring only nine to twelve metres below the ploughed field I had visited with Bill Fox. In my mind's eye I could visualize the glacier riding roughshod over everything in its path, picking up limestone containing chert, and dumping its load helter-skelter on the higher ground.

The puzzle was beginning to fit together, but clearly another field trip was required. It's an exciting experience to go into the field with the strong feeling that this will be the day of discovery. Even the dark, depressing November day, with its rain and snow flurries, didn't dampen my spirits. And sure enough—within a short time I found three outcrops of the Fossil Hill Formation containing "Collingwood" chert.

The three outcrops, although weathered and not well-exposed, were the proof that was needed! Even this exciting evidence was reinforced a week or so later when we found a large, well-exposed "fresh" outcrop containing not one but three beds of chert, one of them almost thirty centimetres thick. This appeared to be excellent material for "flintknapping", so that at one stroke it seemed that we had not only solved our geological mystery, but had found, as well, an abundant source of material of good quality for experimental tool making. It took considerable restraint to keep from prying the outcrop apart and carrying the untold tons of it back to the laboratory.

What we've been talking about up to now involves the thrill of the chase—following clues thousands, and in a sense millions, of years old. After the brief inspiration and excitement of the initial discov-

ery, came the long follow-through of routine work required to document our discovery. The demanding, and sometimes mundane, task of characterizing and "fingerprinting" the full range of Fossil Hill chert so that it can be identified at other archaeological sites has been under way since the fall of 1979. It has involved the grinding of ultra-thin slivers of chert for examination under the microscope, as well as the use of strong acids to dissolve the chert so that any microscopic fossils it may contain can be recovered. Betty Eley, a temporary Research Assistant in the Department of Invertebrate Palaeontology, has been examining the slides to determine whether the Fossil Hill chert was formed in a characteristic way that might serve to differentiate it from other cherts, and whether it contains remains of prehistoric plant life that might also prove uniquely characteristic. Betty Eley is particularly qualified to do this work, since she recently completed a master's thesis on cherts of the Fossil Hill Formation on Manitoulin Island.

Arthur Roberts, a Research Associate in the Department of New World Archaeology, is also involved in the laboratory analysis of the chert. He uses X-rays (in the facilities of the Department of Geography of York University, where he is completing his doctorate) on very small amounts of ground-up Fossil Hill chert to produce X-ray diffractograms. These charts, sometimes almost three metres in length, will show whether the Fossil Hill chert can be differentiated from other chert types by the minor mineral impurities it contains.

While the laboratory studies have been going on, I have been conducting additional field work to determine the geographic extent of the Fossil Hill Formation. Although it has been recognized as far south as Caledon, field evidence appears to indicate that there is little or no chert in the formation south of the Collingwood area. Thus the Early Palaeo-Indian peoples may have found the Fossil Hill chert in a relatively restricted area. Field work is now beginning in the vicinity of the Beaver Valley and of the Bruce Peninsula to determine the extent of the chert beds in the Fossil Hill Formation in that direction.

* * *

Although documentation will require much more field and laboratory work, the outcrops that have been located have convinced us that the geological source of the archaeological material we have long sought to identify is the Fossil Hill Formation. Peter von Bitter's work thus has important archaeological

Opposite page: Some rock formations of Silurian and Ordovician age present in southwestern Ontario and the Collingwood area. (Artwork by Catherine Farley)

Left: Aerial view of the Fisher site. The bush in the foreground is on the former bed of glacial Lake Algonquin and the cornfield on the right is on the higher ground where the Palaeo-Indian sites were found. On the horizon is the Niagara Escarpment—the location of the chert beds used by occupants of the site.

implications, both for interpreting the movements of Early Man in Ontario and for directing future field work.

Since the people(s) who occupied the Parkhill site must have obtained their chert from the Collingwood area, and since the artifacts from the Parkhill site and the Fisher site are similar enough to suggest their manufacture by the same people, we can assume that the two sites were occupied by peoples who travelled between southwestern Ontario and the Collingwood-Georgian Bay area. This evidence for a two-way movement becomes especially significant in view of the size and internal complexities of the two sites. Both are quite large, consisting of a number of more or less discrete concentrations of artifacts and waste flakes from tool manufacture, spread over an area of several tens of acres. While some of these concentrations may represent specialized activity areas where chert was shaped into rough blanks for tool making, or where spear points were made, all of them together probably represent a succession of internally differentiated and complex occupations that occurred intermittently over a long period of time.

Evidence for a two-way movement, combined with indications that the Parkhill site and the Fisher site were probably occupied intermittently, suggests that Early Palaeo-Indian peoples may have moved between southwestern Ontario and the Collingwood-Georgian Bay area on a periodic, perhaps a seasonal, basis. Among modern hunting and gathering peoples, seasonal movements are closely related to the availability of both game and other resources. Early Man in Ontario almost certainly followed a similar lifestyle. Evidence from the Holcombe site in Michigan and the Dutchess Quarry Cave in southeastern New York State suggests that Early Palaeo-Indian peoples in these regions hunted barren ground caribou. Since caribou may have lived in Ontario as well during the latter part of the Ice Age, evidence for a two-way, periodic movement between southwestern Ontario and the Collingwood-Georgian Bay area may reflect a seasonal subsistence cycle adapted, in part, to the hunting of this migratory species.

This interpretation can be carried a step further, again because of the implications of the chert identification and the pattern of band movements it implies. The Fossil Hill chert occurs in exposures near the top of the Niagara Escarpment in the Blue

Opposite page: Early Palaeo-Indian family hearth at the Fisher site. (Artwork by Ivan Kocsis)

Below: Early Palaeo-Indian game look-out and spear-point making activity area at the Fisher site. (Artwork by Ivan Kocsis)

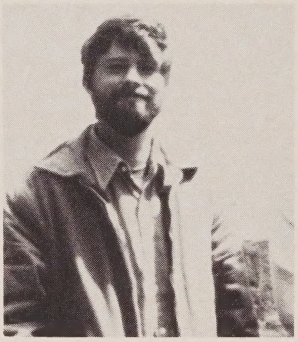
Mountain area, and as occasional nodules in glacial gravels near the bedrock source. Whether Early Palaeo-Indian peoples obtained their chert directly from the bedrock or from secondary deposits, it presumably would have been easier to find during the warm seasons than during the winter when the snow cover was probably quite deep. The Blue Mountain region today lies in a prominent snow belt. While the climate in Ontario during the closing phases of the Ice Age was very much different from what it is today, an even more extensive snow belt probably existed then, owing to the topographic effects of the Blue Mountain highlands and the greater moisture provided by Lake Algonquin, which inundated the Bruce Peninsula and overflowed the basins of Georgian Bay and Lake Huron. The extensive use of the Fossil Hill chert implies, therefore, that it would probably have been obtained during the snow-free seasons of the year. Since the ice sheet was probably not far distant to the north, if the Palaeo-Indian peoples hunted barren ground caribou at this time of the year, the Fisher site may have been located near or within the summering range of the species. The use of Fossil Hill chert by the same band(s) at the Parkhill site suggests, in turn, that the caribou wintered in southwestern Ontario. Thus a pattern of seasonal movement between the Parkhill site and the Fisher site and their vicinities may have been established by Early Palaeo-Indian peoples to adapt to the seasonal movements of caribou. Interestingly enough, D. Brian Deller, a colleague working in southwestern Ontario, has also suggested, independently, and for a number of reasons involving settlement location, ethnographic analogy, and chert distribution, that Early Palaeo-Indian peoples may have migrated on a seasonal basis between southwestern Ontario and the Georgian Bay region.

While my interpretation is speculative, it is also very useful in that it raises a number of questions that can be investigated systematically in the field and in the laboratory. One of the important questions, of course, is whether any Early Palaeo-Indian quarry sites occur near outcrops of the Fossil Hill Formation. If they do, we could learn a great deal about the way in which the chert was shaped into blanks or preforms and tools. Of course, each discovery of an Early Palaeo-Indian site provides another opportunity to find charcoal and animal bone for dating and species identification.

The discovery that the Fossil Hill Formation was the bedrock, if not the actual, source of the chert used by Early Palaeo-Indian peoples in Ontario also suggests a new direction for field work. Up to now the most promising approach to the search for Early Palaeo-Indian sites has been to focus field work on the abandoned strandlines of glacial Lake Algonquin and other Ice Age lakes, since they attracted occupation by Early Man, for reasons as yet not understood. Sites along the strandline, however, seem to represent only a part of the total settlement pattern, since few sites other than temporary overnight camps or larger general-purpose base camps have been found. Now we have an opportunity to use another geographic feature—the bedrock exposure of the Fossil Hill Formation—as a new focus for field work in an attempt to discover unexplored aspects of the settlement pattern, such as interior highland quarry sites and manufacturing sites. In short, knowledge of the source of the chert promises to add a whole new dimension to Palaeo-Indian studies in Ontario.

In the next field season I shall, in a sense, be starting afresh, much as I did in 1973 when I first focused my attention on the Algonquin strandline. Many significant discoveries have been made since that time. We hope that many new ones await us as we begin our search anew along the exposure of an ancient sea bed—unimaginably distant in time from Ice Age man and yet linked in an intricate and important way with his life and the animals he hunted.

Peter L. Storck is Associate Curator in Charge in the Department of New World Archaeology. Dr. Storck obtained his B.Sc., M.Sc., and Ph.D. from the University of Wisconsin (Madison), where he specialized in Environmental Archaeology. Since 1960 his yearly field work has taken him from southern Alaska to central Mexico. His primary research interests are in prehistoric human ecology, lithic technology, and Palaeo-Indian and earlier occupations in the New World.



As a boy growing up on farms in the Niagara Peninsula, Peter von Bitter was an avid collector of Indian artifacts—aspiring to become an archaeologist. He was discouraged from this ambition by what he perceived as a need for a strong background in Latin and Greek, subjects he assiduously wanted to avoid. One summer during his university years, the Nova Scotia Museum employed him to locate and map the sources of raw materials for tools of the earliest inhabitants of Nova Scotia—the Palaeo-Indians whose home much later became the well-known military installation, Camp Debert. Dr. von Bitter is Curator in Charge of the Department of Invertebrate Palaeontology at the ROM and is Associate Professor of Geology at the University of Toronto.

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